Assessment of Nutrition Topics for Education in College-aged Adults

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Abstract Health education courses provide an important setting for teaching nutrition. Common topics for health education have covered personal health barriers or behaviors such as factors related to a healthy diet, food safety, health beliefs, and fundamentals of proper nutrition in groups of people across the lifespan. The purpose of the current study was to assess what college-aged adults *currently* considered as interesting and important for dietary change to determine how nutrition education in higher education could be updated. For this study, 197 participants from across the U.S. and aged 18-23 participated in an online survey. They were asked about their demographic information, if they had any diets/restrictions, health conditions, and their interest and importance in 11 nutrition topics. We found participants ranked low cost healthy food options, and how diet relates to chronic disease as the more interesting and important topics. Additionally, having a food restriction or diet was related to ranking how diet relates to chronic disease as more interesting, $r_s(170) = .31, p < .001$, and was trending to be associated with ranking chronic disease as more important, $r_s(170) = .24, p = .002$. These results suggest that individuals with chronic health conditions may place more value in their diet to maintain or prevent health decline. Additionally, practical education of healthful low-cost foods and proper nutrition to mitigate disease are necessary to strengthen younger consumers' nutrition knowledge and skills.

Keywords: health, education, importance, nutrition, disease, college-aged

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1. Introduction

Nutrition education is now an established and urgent health promotion priority for all age groups [1]. It is widely known that young adults (particularly college students) do not often engage in the healthiest of behaviors as they transition away from home. These health behaviors include proper nutrition and body care, as individuals in this age group may have at least one heart disease risk factor and potentially 25% have advanced atherosclerotic lesions [2,3]. Moreover, many individuals obtain nutrition knowledge from a large pool of sources [4], which could create discrepancies in proper nutrition knowledge, and lead individuals to follow specious health recommendations. Many studies have examined the importance of some nutrition knowledge and beliefs [1,3-8], but those beliefs were more centered on personal health and did not assess how the environment is linked to nutrition topics. For instance, people have recently reported high levels of interest in nutrition and the impacts of food production [9]. Additionally, more studies need to assess interest and importance of nutrition topics in a broader population as previous studies examined one university [4,6,10], young adolescent school curricula

[11,12,13,14], a small sample [15], or singular topics [9,16]. Therefore, the purpose of this study was to obtain preliminary data that assessed what college-aged adults currently considered as interesting and important for nutrition education, and ascertain demographic differences in nutrition topic importance and interest. The results from this study would provide tailored information to help structure future dietary interventions and health/nutrition courses.

Health education courses provide an important setting for teaching nutrition [5]. Indeed, nutrition programs should be tailored and meet the needs of individuals receiving that information. To address tailored needs, one must consider what individuals consider interesting [17] and important, to gain attention and encourage inquiry [5,10]. Nutrition education programs should also depend on the importance given to them by school administration, and the topics that should be covered [12,13]. Previous research on curriculums and health topics have examined personal health barriers or behaviors, such as factors related to a healthy diet [18], food safety [9,15], health beliefs, or fundamentals of proper nutrition [8]. One study on the effectiveness of school nutrition curricula (e.g., yourSelf) for young adolescents found that healthy food choices, nutrients in food, and a food guide for daily portions were considered important nutrition topics to

teach in grade and middle schools [14]. However, few studies have focused on how college-aged adults view broader nutrition education topics, and the ones that have are somewhat dated [8]. Of recent interest are nutrition topics related to the food system, like genetic engineering and food safety [9]. There is also a growing interest in cooking and nutrition because of the burgeoning number of television shows and magazines [16]. Previous research with food topics has also shown that individuals may find dietary recommendations relevant, but stresses a need for more safety and health-related food topics [8]. With that in mind, more targeted age groups and demographics may provide stronger tailored information as to what is interesting and important for nutrition education.

To implement more interventions or educational sessions with college students would help increase motivation and provide education and awareness [6]. This is especially relevant because nutrition knowledge is related to healthier food choices, but many college students do not meet the necessary recommendations for eating servings of vegetables and fruits [3], and 65% of college students regularly consume sugar-sweetened beverages [19]. These are concerns because they have been associated with Type II diabetes and other health risks [3,20,21]. Previously, other health issues such as alcohol, drug, and tobacco use have taken precedence in campus policy due to their acute consequences [22]. Now, there is a growing awareness that healthy eating should be targeted among college-aged adults because this age range could be a critical window for development [23]. Furthermore, higher education systems are increasingly enrolling more students [24], and college campuses have the capacity to influence surrounding communities in practice and example [25]. Indeed, the literature shows there is more often a priority on nutrition education for physicians or healthcare practitioners [26], but most students obtain nutrition knowledge from family members or classes [4]. In fact from a survey of 117 dietetics programs, only 53% offered a course dedicated to nutrition education [27]. Another study found that college-educated students thought knowledge, behavior changes, instructor characteristics, and easy health messages helped them learn the most, but this study did not focus on assessing topics to teach for awareness [10], like food production or sustainability. This may suggest that nutrition education studies in higher education have been somewhat lacking, as a review of online nutrition courses suggested that techniques should be current to reflect practices and trends of larger student groups, and that researchers publish experiences to build the knowledge base of this young, but growing field of nutrition [28].

Because of the lack of tailored nutrition education courses in higher education, the purpose of the current study was to assess what college-aged adults currently considered as interesting and important for proper nutrition knowledge, health, and change. Few, if any studies have addressed how various nutrition topics relate to individuals depending on religious affiliation, chronic disease, or food restrictions/diets. Via a cross-sectional study design, demographic information, religious affiliation, chronic health condition, and diets/food restrictions were assessed to provide insight as to how these demographic influences may impact choices. With these considerations in mind, we had three research aims: 1) assess rankings of

interest and importance for nutrition topics, 2) assess whether gender and health variables (i.e., chronic health conditions or diets/restrictions) were associated with the interest ranking of nutrition topics, and 3) assess whether gender and health variables were associated with the importance ranking of nutrition topics.

2. Method

2.1. Participants

Participants for this study were recruited voluntarily online through a research registry (i.e., Researchmatch.org). ResearchMatch is a volunteer health registry created by multiple academic institutions and maintains support by the U.S. National Institutes of Health as part of the Clinical Translation Science Award program. Volunteers ($N = 386$) stated they were interested in the study, but only 203 opened the survey study link. Of those 203, 197 participants aged 18-23 participated in the study. Sample size was pre-calculated through G*power and indicated that $N = 187$ participants were required for a Chi-Square test with a medium effect size and power set at .80. Individuals that completed the survey tended to be white and female (75.26% White and 83.08% Female). They had a mean age of 20.31 ($SD = 1.36$) years, where most reported being in college ($N = 105$, 54.10%), with a mean family income range of \$50,001 to \$70,000. To be eligible, participants had to be aged 18-24 years. This age range was chosen because it represented typical college students. The age was capped at 24 to maintain homogeneity because there could be an optimistic bias and less awareness of nutrition with this age group [7]. Additionally, peers along with the prevalence of fast/prepared foods on college campuses may influence poor eating behaviors [25,29]. Lastly, 40% of respondents followed a diet or had a diet restriction, and 21% of respondents had a health condition. Participants did not receive any compensation for completing this study. Review and approval for this survey study and all procedures was obtained from the University of Texas at Arlington (UTA) Institutional Review Board (IRB).

2.2. Measures

2.2.1. Demographic Information

Participants were asked about their age, gender, employment (yes or no and, if yes, how many hours they worked), family income, ethnicity, and education (highest degree completed).

2.2.2. Religious affiliation

Participants were asked to indicate their religious affiliation: Atheist, Agnostic, Buddhist, Christian-protestant, Christian-catholic, Christian-nondenominational, Hindu, Jewish, Muslim, or other.

2.2.3. Chronic health Conditions and or Food Restriction/Diet

Participants were asked if they had any chronic health conditions (yes or no), and if yes, what conditions (self-

reported open-ended question). Similarly, participants were asked if they had any special food restrictions or followed any diets (yes or no), and if yes, what diet or food restriction individuals had or followed (self-reported open-ended question).

2.2.4. Nutrition Topics

Participants were asked to rank their perceived 1) interest and 2) importance for 11 nutrition topics and an “other” category if they had another option that was not one of the 11 pre-selected. These 11 topics were chosen based on topics taught in nutrition education courses and nutrition topics that were more represented in media. The topics were then piloted amongst other students to see if certain topics could be added or omitted, and a final list of 11 were selected for this study (see Table 1 and Table 2).

2.3. Procedure

This preliminary study used an online survey through Qualtrics (Qualtrics, Provo, UT) to assess interest and importance of 11 pertinent nutrition topics (12 if they included an “other” topic), demographic questions, religious background, if participants followed any diets or food restrictions, and if participants had any chronic

diseases/health conditions. For recruitment, the survey portion of the study utilized a research registry (i.e., Researchmatch.org). For this study, an initial email providing an overview of the study was sent to those volunteers in the research registry that were qualified (people aged 18-24). The volunteers then had the option to accept the invitation to learn more about this study, or deny the invitation. If a volunteer accepted to learn more about the study, the volunteer’s contact information was released to the researcher, and the researcher then sent a link to the Qualtrics survey in a follow-up email to the interested volunteer. Volunteers were then recruited by opening the link to the Qualtrics survey, accepting the informed consent conditions (part of the Qualtrics survey), and completing the survey. Additionally, all interested volunteers could contact the researchers to obtain more information before consenting. This survey took about 5 to 10 minutes to complete. Because individuals self-selected into the study, this study was a quasi-experimental cross-sectional design. Only one researcher administered the survey, and participants were not grouped at all during data acquisition. If participants declined what was outlined in the informed consent, they were not allowed to continue to the survey and were taken to the end of the survey.

Table 1. Rankings of Interest for Nutrition Topics

Topic	Percent ranked at #1	Count
How to shop and eat healthy at low cost	34.86	61
How diet relates to chronic disease(s)	12.57	22
Vitamins and minerals (their function in the body, and how they relate to overall health)	9.14	16
Food sustainability (organic vs. nonorganic foods, genetically modified organisms, sustainable eating practices)	8.00	14
Calories from beverages	7.43	13
Carbohydrates, proteins, and fats (their function in the body, and how they relate to overall health)	6.86	12
Cooking tricks to make cooking easier and healthier	6.29	11
Recommended serving sizes and daily servings of food groups	5.71	10
Healthy recipe food swaps	4.00	7
Food production and process food goes through to get to supermarkets	2.86	5
Food safety (proper storage of food, common pathogens related to food not properly sanitized, cooking techniques to lessen infection)	1.71	3
Other?	0.57	1

Note. If participants ranked food production as moderately interesting or higher, they were asked to rank their interest of specific food handling processes: (1) beef, (2) pork, (3) poultry, (4) fruit and vegetable, (5) ready-made products (baked goods and ready to eat cereals), and (6) dairy processes in order from one to six.

Table 2. Rankings of Importance for Nutrition Topics

Topic	Percent ranked at #1	Count
How diet relates to chronic disease(s)	23.43	41
Recommended serving sizes and daily servings of food groups	14.86	26
How to shop and eat healthy at low cost	14.86	26
Food safety (proper storage of food, common pathogens related to food not properly sanitized, cooking techniques to lessen infection)	12.00	21
Calories from beverages	11.43	20
Food sustainability (organic vs. nonorganic foods, genetically modified organisms, sustainable eating practices)	6.86	12
Carbohydrates, proteins, and fats (their function in the body, and how they relate to overall health)	6.29	11
Vitamins and minerals (their function in the body, and how they relate to overall health)	4.00	7
Food production and process food goes through to get to supermarkets	3.43	6
Healthy recipe food swaps	1.71	3
Cooking tricks to make cooking easier and healthier	0.57	1
Other?	0.57	1

Note. If participants ranked food production as moderately interesting or higher, they were asked to rank their interest of specific food handling processes: (1) beef, (2) pork, (3) poultry, (4) fruit and vegetable, (5) ready-made products (baked goods and ready to eat cereals), and (6) dairy processes in order from one to six.

3. Results

3.1. Data Analysis

For Aim I, we assessed rankings of interest and importance for nutrition topics using descriptive statistics. For Aim II of whether gender, chronic health conditions, and/or diets/restrictions were associated with the interest ranking of nutrition topics, and Aim III of whether gender, chronic health conditions, and/or diets/restrictions were associated with the importance ranking of nutrition topics, we used Spearman's rho correlations. A Bonferroni correction was applied for Aims II and III to adjust for an inflated type I error rate associated with examining multiple correlations.

Results showed that the survey was delivered as intended, and the target age group was assessed. About 10% of the data were missing, but were random. To be conservative with handling missing data, analyses were examined listwise. As a check for potential confounds/covariates, Chi-Square tests of independence were conducted to examine whether gender, employment, family income, ethnicity, and religion were related to chronic conditions and food restrictions/diet. However, none of these relationships were significant.

3.2. Ranking Frequencies of Nutrition Topic Importance and Interest

For Aim I, descriptive statistics showed participants ranked how to shop for low cost healthy food options, how diet relates to chronic disease, and vitamins and minerals as the most interesting nutrition topics (see Table 1). Additionally, participants ranked how diet relates to chronic disease, how to shop for low cost healthy food options, and recommended serving sizes and daily food groups as the most important nutrition topics (see Table 2).

3.3. Relationships of Gender and Health Variables with Interest Ranking of Topics

For Aim II, Spearman's rho bivariate correlations were conducted on gender (male or female, with female coded higher), food restrictions/diets (had a food restriction/diet or did not, with not having a food restriction or diet coded higher), and whether one had a chronic health condition (no or yes, with yes coded higher) with the interest ranking of the 11 nutrition topics (lower numbers rated as more interesting). The "other" category was omitted from these analyses because it had mixed responses and not enough data for proper analysis. The results for the Spearman's correlations showed no significant correlations with gender after applying a Bonferroni correction for this aim (i.e., $p = .05/33 = .00151$). However, having a chronic disease was associated with ranking how diet relates to chronic disease as more interesting, $r_s(172) = -.36, p < .001$. Additionally, having a diet/food restriction was associated with ranking how diet relates to chronic disease(s) as more interesting, $r_s(170) = .31, p < .001$.

3.4. Relationships of Gender and Health Variables with Importance Ranking of Topics

For Aim III, additional Spearman's rho bivariate correlations were conducted on gender, food restrictions/diets, and whether one had a chronic health condition with the importance ranking of the 11 nutrition topics (lower numbers rated as more important). The results showed no significant associations after applying a Bonferroni correction, although having a diet/food restriction was trending to be related to ranking how diet relates to chronic disease as more important, $r_s(170) = .24, p = .002$. As a check, the correlation between the ranking of interest and importance for how diet relates to chronic disease was small to medium, $r_s(173) = .26, p < .001$. Kendall's tau bivariate correlations were also conducted on age, income, and education with the interest and importance ranking of the 11 nutrition topics, but none of these associations were significant after applying a Bonferroni correction.

4. Discussion

The purpose of this study was to obtain preliminary data that assessed what college-aged adults aged 18-24 currently considered as interesting and important for nutrition courses and education. Specifically, we wanted to determine relative rankings of interest and importance of 11 nutrition topics, and assess whether gender and health variables (i.e., chronic health conditions or diets/restrictions) were associated with the interest and importance ranking of nutrition topics. With these aims, we were able to obtain rankings of interest and importance for these health topics. Additionally, we found that having a chronic disease or a food restriction/diet was associated with ranking how diet relates to chronic disease as more interesting. Thirdly, having a food restriction or diet was marginally associated with ranking how diet relates to chronic disease as more important.

For Aim I, participants rated how diet relates to chronic disease as one of the most interesting and important health topics, which may be incorporated into future educational classes or health interventions (see Tables 1 and 2). A previous study showed that older individuals have more interest in chronic health-related topics over younger individuals [8], but to our knowledge no other studies have shown similar findings. Although, educators agree that how nutrition leads to a healthy lifestyle and healthy food choices are important teaching topics [14,30].

For Aim II, having a diet/food restriction or a chronic health condition was associated with ranking chronic disease(s) as more interesting. For Aim III, having a diet/food restriction was trending to be related to ranking diet and chronic disease(s) as more important. Because most of the diets that individuals identified as having were vegetarian or vegetarian related, these results corroborate with the notion that vegetarians are more health conscious than non-vegetarians and subsequently place more value in their diet to maintain good health [31]. Additionally, those with no food restrictions/diets may be more

optimistic and not as concerned about chronic disease [29]. Indeed, we understand the opposite association could have occurred here, with more individuals without chronic disease ranking how diet relates to chronic disease as less interesting and important. Undoubtedly, individuals with less income and less education may be more concerned about the obtainment of food over specific health recommendations and the mitigation of disease risk. Thus, proper and practical dissemination of health education is important for health management [32].

4.1. Limitations

It should be noted that in addition to the age range being restricted, this sample consisted of individuals who self-selected into the study. Because of these precedents, individuals in this study may have had stronger opinions about nutrition topics, and may not have represented the average individual in terms of these opinions. Moreover, the sample was primarily white and female. Despite these limitations, the results considered individuals' opinions from across the United States. We found there were not any significant associations between gender, employment, family income, ethnicity, or religious background with chronic health conditions or food restrictions/diet. These lack of associations suggest that certain health conditions or food restrictions/diet were not driven by one demographic measure in a young adult population. Previous research has shown that in a worldwide adult population, being older, having lower income, being unemployed, having less education, and being female were each associated with worse health [33]. However, this same study did not find significant differences in health across various countries [33], suggesting there may not be large health differences between races.

4.2. Conclusion

These findings highlight that practical education, such as choosing healthful low-cost foods, learning about food sustainably, and understanding proper nutrition are necessary to develop public aptitude for health. Incorporating these types of nutrition topics in education programs for targeted populations, such as college students, may help more individuals become conscious consumers who make favorable food choices. Moreover, there is a growing interest in nutrition information, which indicates a need for understanding how to communicate nutrition information effectively with the broader population and with population subgroups for healthy lifestyle development. By focusing on nutrition topics that people rate as interesting and important, the target group may be more engaged and receptive to nutrition communication. Hence, future research should target various subgroups for nutrition education to invoke greater involvement, and achieve a better understanding of targeted nutrition and health.

Statement of Competing Interests

The authors state no competing interests with this study.

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